

PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In the Application of:

BEUERMANN ET AL.

CASE NO.: FA0890 US NA

APPLICATION NO.: UNKNOWN

GROUP ART UNIT: UNKNOWN

FILED: CONCURRENTLY HEREWITH

EXAMINER: UNKNOWN

FOR: PROCESS FOR THE PREPARATION  
OF POWDER COATING COMPOSITIONS

**PRELIMINARY AMENDMENT**

Assistant Commissioner for Patents  
Washington, DC 20231

Sir:

Before examination of the above-referenced application, please amend the application as follows:

**IN THE SPECIFICATION:**

At page 1, between lines 4 and 5, insert the following paragraph heading:

**Field of the Invention:**

At page 1, between lines 7 and 8, insert the following paragraph heading:

**Background of the Invention:**

At page 2, between lines 2 and 3, insert the following paragraph heading:

**Summary of the Invention:**

At page 2, between lines 35 and 36, insert the following paragraphs:

**Brief Description of the Drawings:**

Fig. 1 illustrates a process for the preparation of a polymer in the homogeneous phase, separation of the phases I (sc fluid/polymer) and phase II (monomers/sc fluid) and separation of the polymer powder.

Fig. 2 illustrates a process in which the process is supplemented by the additional step of adding hardeners and/or additives.

Fig. 3 illustrates a process in which, in addition, the process step of extraction of residual monomers and accompanying substances from phase I is carried out and the sc fluid is recycled.

**Detailed Description of the Invention:**

**IN THE CLAIMS:**

Please CANCEL claims 1-27 without prejudice.

Please ADD new claims 28-54 as follows:

28. (New) A process for preparing a polymer powder in a supercritical fluid comprising:

- (a) reacting in a homogeneous phase at least two copolymerizable ethylenically unsaturated monomers with an initiator, said reacting occurring in a supercritical fluid, to form a reaction mixture; and
- (b) converting the reaction mixture to said polymer powder by depressurizing and removing the supercritical fluid from the reaction mixture.

29. (New) The process of claim 28 wherein, after said reacting, said process further comprises:

adding additional supercritical fluid or altering the temperature or pressure of the reaction mixture to form at least two phases, a phase I containing predominantly polymer and supercritical fluid and a phase II containing predominantly unreacted monomers and supercritical fluid; and separating said phase I from said phase II,

wherein said phase I is the reaction mixture converted during said converting.

30. (New) The process of claim 28 wherein the supercritical fluid is a non-reactive supercritical solvent.

31. (New) The process of claim 28 wherein said reacting comprises at least three copolymerizable ethylenically unsaturated monomers and at least one monomer containing an additional functional group.

32. (New) The process of claim 28 wherein said supercritical fluid comprises up to 20 wt % of an organic solvent.

33. (New) The process of claim 28 wherein said reacting occurs at a pressure between 80 to 450 bar and at a temperature between 70 to 250 °C.

34. (New) The process of claim 28 that is a batchwise process or a continuous process.

35. (New) The process of claim 28 wherein depressurizing the supercritical fluid causes a volatile accompanying substance to separate from said polymer powder.

36. (New) The process of claim 29 wherein an additional depressurization step purifies said phase I prior to said depressurizing.

37. (New) The process of claim 36 wherein said additional depressurization step is a counter-current extraction process using a supercritical fluid.

38. (New) The process of claim 29 wherein said phase II is separated and recycled into said reacting.

39. (New) The process of claim 38 wherein the supercritical fluid is separated from said phase II before said supercritical fluid is recycled into said reacting.

40. (New) A process for preparing a powder coating comprising:

- (a) forming a polymer powder using the process of claim 28; and
- (b) processing said polymer powder to form said powder coating.

41. (New) The process of claim 40 wherein said powder coating is formed using an extrusion process, an ultrasonic atomization method, a supercritical fluid, or a steam assisted micronization.

42. (New) The process of claim 41 that further comprises the addition of at least one of a hardener, powder coating additive, dye, pigment, and extender.

43. (New) A process for preparing a powder coating comprising:  
reacting in a homogeneous phase at least two copolymerizable ethylenically unsaturated monomers with an initiator, said reacting occurring in a supercritical fluid, to form a reaction mixture;  
adding additional supercritical fluid or altering the temperature or pressure of the reaction mixture to form at least two phases, a phase I containing predominantly polymer and supercritical fluid and a phase II containing predominantly unreacted monomers and supercritical fluid;  
separating said phase I from said phase II; and  
processing said phase I by adding additional components of a powder coating to form a phase I process mixture; and  
converting the phase I process mixture to said polymer powder by depressurizing and removing the supercritical fluid from the process mixture.

44. (New) The process of claim 43 wherein said separated phase I undergoes a further step of separating accompanying substances.

45. (New) The process of claim 43 wherein said additional components include a hardener that reacts with functional groups of the polymer prior to said processing.

46. (New) The process of claim 43 wherein further additives are added to the process mixture.

47. (New) The process of claim 43 wherein said additional components, before being added, are homogenized in a super critical fluid.

48. (New) The process of claim 43 wherein the process mixture is sprayed by a nozzle into a spray tower or a liquid.

49. (New) The process of claim 48 wherein said liquid is an aqueous medium.

50. (New) The process of claim 48 wherein the super critical fluid that is gaseous after spraying is purified and recycled in said process.

51. (New) The process of claim 43 wherein said reacting comprises at least three copolymerizable ethylenically unsaturated monomers, wherein at least one monomer additionally contains further reactive functional groups, and wherein the dispersity of the polymer is  $< 3$ .

52. (New) A powder coating prepared by the process of claim 51, wherein said powder coating has an average particle size below 50  $\mu\text{m}$ .

53. (New) The powder coating of claim 52 that is a powder clear coat.

54. (New) The powder coating of claim 53 that is colored with at least one of a pigment or a dye.


RECEIVED  
FEB 15 2009  
FBI/DOJ

### REMARKS

The specification has been amended to include the subject headings suggested by the U.S. Patent and Trademark Office, and a brief description of the drawings has been added. In addition, original claims 1-27 have been rewritten in U.S. format as new claims 28-54. The amendments to the specification and claims are fully supported by the priority application, DE 100 54 114.3-43, filed October 31, 2000.

It is respectfully requested that the Examiner enter this amendment prior to examining the application on its merits.

Respectfully submitted,

  
SUDHIR G. DESHMUKH  
ATTORNEY FOR APPLICANTS  
REGISTRATION NO. 33,677  
TELEPHONE: (302) 992-4385  
FACSIMILE: (302) 992-2533

Dated: 8/23/2001

FOR FILING